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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,948	11/03/2003	Ari Karkkainen	4090-9	5027

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EXAMINER
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INGHAM, JOHN C

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 01/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/698,948

Applicant(s)

KARKKAINEN, ARI

Examiner

John C. Ingham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-33 and 35-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/29/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of the Group II invention, Claims 9 to 33 and 35 to 37, in the reply filed on 1/9/06 is acknowledged.
2. Claims 1-8 and 34 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/9/06.
3. Applicant is requested to cancel the non-elected claims as part of a complete response to the office action. Cancellation of the non-elected claims would not preclude the later filing of a divisional application on the non-elected invention (please see 35 USC 120 and 121).

### ***Specification***

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

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- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims **9-11, 17-18, 26-33, and 35** are rejected under 35 U.S.C. 102(b) as being anticipated by Gupta (US 5,379,359).

Regarding claim **9**, Gupta discloses an optical assembly (Fig 6) comprising: first and second optical components (laser diode items 38-46, waveguide 60, col 4 ln 30-34), each having an optical confinement region and an optical axis in use, the first optical component having a bonding surface (68); and a shared substrate (62), wherein the first

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component is mounted on the shared substrate by means of its bonding surface and the first and second components are supported by the shared substrate such that their respective optical confinement regions are optically coupled in use (col 4 ln 30-34) and wherein the first component (diode) comprises a spacing layer (38) which determines the distance from the bonding surface to the optical axis for the first component to achieve said optical coupling in use (col 3 ln 54-58).

Regarding claim **10**, Gupta discloses that the shared substrate (62) provides a planar surface (dotted line) on which both first and second components are mounted to achieve optical coupling in use.

Regarding claim **11**, Gupta discloses in Figure 5 an assembly wherein the second optical component (53) has a bonding surface (51) and both the first (Fig 6 items 38-46) and second (53) components are mounted on the shared substrate (Fig 5 item 30, Fig 6 item 62) by means of their bonding surfaces.

With regards to claim **17**, Gupta discloses in Figure 5 wherein the spacing layer (38) provides the whole distance between the bonding surface (68) and the optical confinement region.

Regarding claim **18**, Gupta discloses in Figure 6 wherein the spacing layer (44) provides only part of the distance (partly provided by contact 46) between the bonding surface (68) and the confinement region.

Regarding claim **26**, Gupta discloses that the first component comprises a laser diode (col 3 ln 29).

Regarding claim **27**, Gupta discloses that the laser diode comprises gallium arsenide, a III-V material.

With regards to claim **28**, Gupta discloses in Figures 5 and 6 an optical assembly comprising at least first and second optical components mounted in optical alignment with each other, each component comprising at least one layer and a substrate and providing an optical confinement region in use, wherein the optical assembly further comprises a shared substrate (Fig 5 item 30, Fig 6 item 62), the first and second optical components (Fig 6 item 38-46 and Fig 5 item 53) each being mounted so that its optical confinement region lies between its respective substrate and the shared substrate.

Regarding claim **29**, Gupta discloses in Figures 5 and 6 wherein the shared substrate comprises a planar surface on which the first and second optical components are mounted.

With regards to claim **30**, Gupta discloses wherein the first optical component (Fig 6 items 38-46) comprises a spacing layer (44) between the optical confinement region (42) and the shared substrate (62), said spacing layer being of a depth to provide optical alignment (col 3 ln 54-57).

Regarding claim **31**, Gupta discloses wherein the substrate comprised by the first component (30) has different characteristics from the substrate (55) comprised by the second component (30 is GaAs, 55 is LiTaO<sub>3</sub>).

Regarding claim **32**, Gupta discloses in Figure 1 wherein the substrate (22) comprised by the first component (10) has a different depth from the substrate (26) comprised by the second component.

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With regards to claim **33**, Gupta discloses wherein the first component (38-46) is provided with an electrical connection (46) by means of its bonding surface (Fig 6).

Regarding claim **35**, Gupta discloses in Figure 5 an optical assembly comprising at least two components in optical alignment on a shared substrate (30), wherein an optical cladding layer (38) of the first component and a support surface (51) for the second component are provided by areas of a layer fabricated on the shared substrate

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims **12 and 37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta and Tada (5,684,902).

Regarding claim **12**, Gupta discloses the assembly according to claim 11, but does not disclose wherein the distance from the bonding surface to the optical axis for

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the first component is different from the bonding surface to the optical axis for the second component, the shared substrate providing a non-planar surface on which both first and second components are mounted.

Regarding claim **37**, Gupta discloses the assembly according to claim 35, but not wherein the fabricated layer is discontinuous.

Tada teaches in Figure 1 a structure wherein the substrate (1) has a groove (2) cut into it for mounting of the second component (6), the groove allowing automatic and accurate positioning of the second component (col 1 ln 45-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Tada on the device disclosed by Gupta.

9. Claim **13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta and Tada as applied to claim 12 above, and further in view of Glebov (US 6,922,508). Gupta and Tada do not disclose wherein a glass material having both organic and inorganic components provides the non-planar surface.

Glebov teaches the use of organic/inorganic glass hybrids (col 6 ln 15-20) as cladding layers and substrates (col 4 ln 20) due to its high transparency (col 6 ln 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Glebov (a hybrid glass substrate) on the device disclosed by Gupta.

10. Claims **14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta as applied to claim 11 above, and further in view of Blauvelt (US 6,987,913).

Gupta does not disclose wherein the distance from bonding surface to optical axis for the two components is within 300nm, or 100nm. Blauvelt teaches that the desired objectives of optical junctions are vertical position accuracies of 20nm (col 8 ln 58-59), and teaches a structure of passively aligned photodiodes and waveguides (Fig 20B). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Blauvelt on the structure of Gupta, to mount two optical components with optical regions aligned within 20nm of each other, since optical power transfer can be maintained above the 90% level in this arrangement (col 8 ln 60).

11. Claims **16 and 36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta and Glebov.

Gupta discloses an optical assembly according to claims 9 and 35, but does not disclose wherein the material of the spacing layer (fabricated layer) comprises a hybrid glass material (having both organic and inorganic components). Glebov teaches that cladding layers may be made of glassy hybrid materials (col 6 ln 15-20), since these materials are highly transparent (col 6 ln 14). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Glebov (a clad layer of glass) on the device disclosed by Gupta.

12. Claims **19-22, 24, and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta and Glebov as applied to claim 16 above, and further in view of Nashimoto (US 6,816,660).

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Gupta and Glebov do not disclose wherein the glass material comprises an inorganic matrix provided in part by a metal alkoxide or salt that has been hydrolyzed. Nashimoto teaches that glass may be formed by applying metal salts by a sol-gel method and heated (col 11 ln 32-36), producing an extremely smooth thin film with low light loss (col 11 ln 40- 42). Various types of metals and organic compounds are used in metal salts, including those in groups 3A, 3B, etc. of the periodic table. Nashimoto teaches that the glass material is processed at a temperature ranging from 100° to 500°C.

13. Claim **23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta, Glebov, and Nashimoto as applied to claim 21 above, and further in view of Kaneko. Gupta, Glebov, and Nashimoto do not disclose wherein the glass material comprises a thermal initiator to polymerize the glass material. Kaneko teaches a method of making an optoelectronic material comprising a thermal initiator (silane chloride) for polymerization (abstract), which has an easily controllable refractive index (col 3 ln 38-39).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Ingham whose telephone number is (571) 272-8793. The examiner can normally be reached on M-F, 8am-5pm.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John C Ingham  
Examiner  
Art Unit 2814

jci



HOWARD WEISS  
PRIMARY EXAMINER